REMARKS

The present application was filed on October 12, 2001, with claims 1-24. In a previous Office Action, the Examiner withdrew claims 15-18 and 20-24 from consideration. With a previous response, Applicants added claim 25. Consequently, claims 1-14, 19, and 25 are pending. In the outstanding final Office Action, the Examiner rejected claims 1-3 and 25 under 35 USC §102(e), rejected claims 4, 6, 8-14, and 19 under 35 USC §103(a), and objected to claims 5 and 7.

Change to Specification

Applicants have amended the specification. This amendment is supported, *inter alia*, by page 17, line 26 to page 18, line 5 of Applicants' specification.

Rejection of Claims 1-3 and 25 under 35 USC §102(e)

In the outstanding final Office Action, the Examiner rejected claims 1-3 and 25 under 35 USC §102(e) as being anticipated by Chen, U.S. Patent No. 6,571,368 (hereinafter, "Chen"). The Examiner basically asserted that all limitations in claims 1-3 and 25 are taught by Chen.

Applicants respectfully traverse this rejection. Independent claim 1 includes the following limitations (emphases added): (1) "a plurality of key equation determination devices, each key equation determination device coupled to at least one of the N-parallel syndrome generators and being adapted to determine at least one error polynomial by using a corresponding plurality of syndromes from the at least one N-parallel syndrome generator," and (2) "a plurality of N-parallel error determination and correcting devices, one for each of the N-parallel syndrome generators, each N-parallel error correction and determination device coupled to one of the key equation determination devices and being adapted to use the at least one error polynomial produced by the one key equation determination device to correct errors in the parallel data stream."

In limitation (1), Applicants therefore claim a plurality of key equation determination devices, where each key equation determination device is adapted to determine at least one error polynomial. The only device in FIG. 6 of Chen that may be

considered, for sake of argument, to determine "at least one error polynomial" is an E array disclosed in FIG. 6 of Chen. For instance, Chen states that a second stage of a structure shown in FIG. 6 of Chen performs Euclid's algorithm. The E array includes cells 610-615, 620-625, and 630-635. Chen at col. 9, lines 9-13. Chen also states that Euclid's algorithm determines an error location polynomial $\Lambda(x)$ and an error evaluator polynomial $\Omega(x)$. Chen at col. 8, lines 54-59. Furthermore, Chen states that the error location and evaluator polynomials accumulate in the G row of the second cells 620-625 of the E array and that the polynomials pass in parallel from G row cells 620 to 625 to the cells 640 to 645 of the error evaluator array Ω_Λ. Chen at col. 9, lines 38-41.

As Chen indicates that the single E array in FIG. 6 of Chen is the device that determines error location and evaluator polynomials, then Chen does not disclose a plurality of key equation determination devices, where each key equation determination device is adapted to determine at least one error polynomial, as claimed in limitation (1) of independent claim 1.

Furthermore, in limitation (2) of independent claim 1, Applicants claim a plurality of N-parallel error determination and correcting devices, where each N-parallel error correction and determination device is adapted to use the at least one error polynomial produced by a corresponding key equation determination device to correct errors in the parallel data stream. Chen states that error location and value evaluation are performed by the error evaluator array Ω_Λ, which has cells 640-645. Chen at col. 9, lines 27-32. Chen also states that the error location polynomial and the error evaluator polynomial are evaluated to get the error locations and values, then the errors are corrected "by subtracting E(x) from the received codes." Chen at col. 6, lines 64-67. There is no indication in Chen that the error evaluator array Ω_Λ in Chen corrects errors.

Applicants can find only one disclosed device in Chen that corrects errors, and that is the Galois Field adder 516 in Chen. For instance, FIG. 26 in Chen shows control logic for the evaluation computation, but the control logic in FIG. 26 ends with sequential outputting of the error polynomial E(x). Chen at col. 17, line 47 to col. 18, line 3. Chen states that an additional step of subtracting E(x) from the received codes is

necessary, and the only device that does this subtraction in Chen is the single Galois Field adder 516 in Chen. See FIG. 5 of Chen and col. 6, lines 62-67 of Chen.

Therefore, Chen does not disclose a plurality of N-parallel error correction and determination devices, where each N-parallel error correction and determination device is adapted to use the at least one error polynomial produced by the one key equation determination device to correct errors in the parallel data stream, as claimed in limitation (2) of independent claim 1. Because Chen does not disclose at least limitations (1) and (2) of independent claim 1, independent claim 1 is patentable over Chen.

In the final Office Action, the Examiner makes an argument that one could group certain elements of FIG. 6 of Chen and groups of elements would then equate with limitations of independent claim 1. For example, the Examiner states (see paragraph spanning pages 9 and 10 of the outstanding final Office Action) that "Chen teaches a decoder comprising: a plurality of N-parallel syndrome generators (in Figure 6 of Chen, the Syndrome Generators S_0-S_{2t} can be grouped in twos $[S_1,S_2]$, $[S_3,S_4]$...$[S_{2t-1},S_{2t}]$ whereby each of the $[S_{2k-1},S_{2k}]$, as k ranges from 1 to t, is an N=2-parallel syndrome generator; hence Chen teaches t N-2-parallel syndrome generators)."

However, there is no indication in Chen that Chen's elements can be grouped as suggested by the Examiner. Furthermore, Applicants respectfully submit that the Examiner's argument goes against the teaching of Chen. The Examiner asserts that groups of elements, such as groups of certain cells 610-615, 620-625, and 630-635 of the E array and certain cells 640-645 of the error evaluator array Ω_Λ, are equivalent to "a plurality of N-parallel error correction and determination devices," as recited in limitation (2) of independent claim 1. However, limitation (2) also generally recites that each N-parallel error correction and determination device is adapted to use the at least one error polynomial produced by the one key equation determination device to correct errors in the parallel data stream. As stated above, Applicants can find only one disclosed device in Chen that corrects errors, and that is the Galois Field adder 516 in Chen.

Therefore, Applicants respectfully submit that independent claim 1 is patentable over Chen. Because independent claim 1 is patentable over Chen, dependent claims 2, 3, and 25 are also patentable. Applicants respectfully request the §102(e) rejections to claims 1-3 and 25 be withdrawn.

Rejection of Claims 4-14 and 19 under 35 USC §103(a)

In the outstanding Office Action, the Examiner rejected claims 4 and 6 under 35 USC §103(a) as being unpatentable over Chen in view of Yun, U.S. Patent No. 5,526,368. The Examiner rejected claims 8, 9, and 19 under 35 USC §103(a) as being unpatentable over Chen in view of White, U.S. Patent No. 5,754,563 (hereinafter "White"). The Examiner rejected claims 10-14 under 35 USC §103(a) as being unpatentable over Chen in view of Mastrovito, VLSI designs for multiplication over finite fields *GF(2^m)*," Int'l Conf. on Applied Algebra, Algebraic Algorithms, and Error-Correcting Codes, 297-309, Rome, (1988).

Because independent claim 1 is patentable, dependent claims 4, 6, and 8-14, which depend from independent claim 1, are also patentable for at least the reasons identified above with respect to independent claim 1. Consequently, Applicants respectfully request withdrawal of the §103(a) rejection of claims 4, 6, and 8-14.

Regarding independent claim 19, the Examiner asserted that independent claim 19 was unpatentable over Chen in view of White. In independent claim 19, Applicants claim the limitations of (A) "performing, in parallel and by using each of the plurality of syndromes generated by each of the plurality of N-parallel syndrome generations, a plurality of N-parallel decodings of the parallel data stream to determine, in parallel, a plurality of error value and error locator polynomials" and (B) "correcting errors, by using a plurality of N-parallel correction and determination processes that use the error value and error locator polynomials, in the parallel data stream." Thus, in limitation (A), a plurality of error value and error locator polynomials are determined. In limitation (B), errors are corrected by using the error value and error locator polynomials.

As described above, Chen discloses that the E array produces an error location polynomial and an evaluator polynomial. See Chen at col. 9, lines 38-41, col. 9, lines 9-13, and col. 8, lines 53-65. In independent claim 19, a plurality of error value and error locator polynomials are determined in limitation (A) and errors are corrected by using the error value and error locator polynomials in limitation (B). Thus, Chen does not disclose at least limitations (A) and (B) of independent claim 19.

Applicants respectfully submit that White does not teach or imply limitations (A) or (B) as recited in independent claim 19. In particular, White states that "[t]he output of the key equation solver is an error locator polynomial, L(x), and an error evaluator polynomial, V(x), multiplied by the constant polynomial x, i.e. xV(x)" at col. 3, lines 53-54. There is no disclosure or implication in White of determination of a plurality of error value and error locator polynomials or of correcting errors by using the error value and error locator polynomials, as claimed in limitations (A) and (B) of independent claim 19.

Because neither Chen nor White teach a plurality of error value and error locator polynomials or of correcting errors by using the error value and error locator polynomials, as claimed in limitations (A) and (B) of independent claim 19, the combination of Chen and White cannot teach these limitations.

Consequently, Applicants respectfully submit that amended claim 19 is patentable over Chen and White in combination and respectfully request the withdrawal of the §103(a) rejection of claim 19.

Conclusion

Applicants respectfully submit that claims 1-4, 6, 8-14, 19, and 25 are patentable over the cited art. The Examiner has allowed claims 5 and 7. The Examiner's attention to this matter is appreciated. As indicated previously, a Notice of Appeal is submitted concurrently herewith.

Respectfully submitted,

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Enclosure(s): Notice of Appeal